

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 117538 USN	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/SE2003/001917	International filing date (day/month/year) 10-12-2003	Priority date (day/month/year)
International Patent Classification (IPC) or national classification and IPC See Supplemental Box		
Applicant Telefonaktiebolaget LM Ericsson (publ) et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 02-05-2005	Date of completion of this report 31-03-2006
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Anna Flodman/MP Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001917

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Cover sheet

International patent classification (IPC)

H03B 5/20 (2006.01)

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001917

Box No. I Basis of the report

1. With regard to the language, this report is based on:



the international application in the language in which it was filed

a translation of the international application into _____,
which is the language of a translation furnished for the purposes of:

international search (Rules 12.3(a) and 23.1(b))



publication of the international application (Rule 12.4(a))



international preliminary examination (Rules 55.2(a) and/or 55.3(a))

2. With regard to the elements of the international application, this report is based on
- (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*



the international application as originally filed/furnished



the description:

pages 1 - 12 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____



the claims:

pages _____ as originally filed/furnished

pages* _____ as amended (together with any statement) under Article 19

pages* 1 - 2 received by this Authority on 23 - 03 - 2006

pages* _____ received by this Authority on _____



the drawings:

pages 1 - 8 as originally filed/furnished

pages* _____ received by this Authority on _____

pages* _____ received by this Authority on _____



a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

- 3.
- ☐
- The amendments have resulted in the cancellation of:



the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____

the sequence listing (*specify*): _____any table(s) related to the sequence listing (*specify*): _____

- 4.
- ☐
- This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).



the description, pages _____



the claims, Nos. _____



the drawings, sheets/figs _____

the sequence listing (*specify*): _____any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001917

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-11</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-11</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-11</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

Documents cited in the International Search Report:

D1: US 4325032 A
D2: US 20020008551 A1
D3: US 6396358 B1
D4: US 6323910 B1

The cited documents represent the general state of the art.
The invention defined in claims 1-11 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed oscillator circuit with tuneable delay means. Therefore, the claimed invention is not obvious to a person skilled in the art.
Accordingly, the invention defined in claims 1-11 is novel and is considered to involve an inventive step. The invention is industrially applicable.

CLAIMS

1. An oscillator circuit (100, 200, 300, 400, 500), comprising an oscillating element (110, 210, 310, 410, 510) and output means (115, 215, 315, 415) for
5 outputting an oscillation frequency from said oscillating circuit, the circuit further comprising a signal delay means (120, 220, 320, 420, 520, 525) which is arranged in series with the oscillating element and feeds the output signal back to the oscillating element, the delay means (120, 220, 320, 420, 520, 525) being tuneable with respect to the delay it provides, characterized in
10 that the signal delay means (420) is a tuneable delay line comprising a control input, to which is connected the output signal from an amplitude detector (440), with the amplitude detector sampling the signal at a chosen point in the circuit (400) and controlling the delay means so that a maximum output signal is obtained from the oscillator circuit.
- 15 2. The oscillator circuit (100, 200, 400) of claim 1, in which the oscillating element is an amplifier (110, 210, 410).
3. The oscillator circuit (100, 200, 400) of claim 2, further comprising a filter
20 (130, 230, 430).
4. The oscillator circuit (100, 200) of claim 3, in which the delay means (120, 220) is a Delay Locked Loop.
- 25 5. The oscillator circuit (100) of claim 4, in which the filter (130) is a pass-band filter connected in series with the delay element (120), so as to filter the signal before it is fed back to the oscillating element (110), but after it has passed through the delay element.
- 30 6. The oscillator circuit (200) of claim 4, in which the filter (230) is a stop-band filter connected between the output means (215) and ground, so as to enable only the desired frequency to pass.

7. The oscillator circuit (400) of claim 4, in which the filter (430) is a stop-band filter connected between the output means (215) and ground, so as to enable only the desired frequency to pass.
- 5 8. The oscillator circuit (300, 500) of claim 1, in which the oscillating element is a voltage controlled oscillator (310, 510, 515).
9. The oscillator circuit (300) of claim 1 or 8, in which the delay means (320) is a Delay Locked Loop.
- 10 10. The oscillator circuit (500) of claim 1 or 8, in which the delay means (520, 525) is a tuneable delay line.
11. The oscillator circuit of claim 8 or 10, comprising at least a first and a
15 second VCO (510, 515) and first and second tuneable delay lines (520,525), in which the VCO:s (510, 515), are connected in series via two branches, an "upper" and a "lower" branch, the output of the "lower" branch being used as input to the "upper" branch, and the output of the "upper" branch being used as input to the "lower" branch, with the delay means being connected one
20 between each of the VCO:s, in series with them, so that the upper branch output of the first and second VCO are separated by the same phase distance as their respective lower branch outputs, suitably ninety degrees.